

**REMARKS****INTRODUCTION:**

In accordance with the foregoing, claims 4, 5, 11, and 12 have been canceled without prejudice or disclaimer, claims 1, 7, 8, 13, and 14 have been amended, and new claim 15 has been added. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1, 7, 8, 13, 14 and 15 are pending and under consideration. Reconsideration is respectfully requested.

**REJECTION UNDER 35 U.S.C. §112:**

In the Office Action, at page 2, claims 1, 4-5, 7-8, and 11-14 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth therein. This rejection is traversed and reconsideration is requested.

Independent claim 1 has been amended to show more clearly the structure/composition/arrangement of the magnetic core.

Independent claim 5 has been canceled without prejudice or disclaimer.

Claim 7, which previously depended from claim 5, has been amended to depend from amended independent claim 1.

Independent claim 8 has been amended to depend from amended independent claim 1. Independent claim 12 has been canceled without prejudice or disclaimer.

Independent claim 1 has been amended to show more clearly the structure/composition/arrangement of the magnetic core so that amended independent claim 1 recites: "A bandpass filter, comprising: an inductor having a non-gapped core that consists essentially of an Fe-B-Si amorphous alloy ribbon with Fe content in a vicinity of 80 atomic percent and having a crystallization temperature ranging from 500°C to 530°C and heat-treated below the alloy's crystallization temperature, a linear BH loop and a constant permeability ranging from 400 to 1000 over a frequency range of about 1 to 1000 kHz, wherein the permeability is linear up to an induction level of 13 kG."

Claim 13 has been amended for clarity to recite: "A bandpass filter, comprising: an inductor having a non-gapped core consisting essentially of an Fe-based amorphous metal alloy ribbon with an Fe content in a vicinity of 80 atomic percent and having crystallization temperature ranging from 500°C to 530°C, heat-treated below the alloy's crystallization temperature, and having a linear BH loop having a squareness ratio that approaches zero over a

field strength range of approximately -15 to +15 Oersteds, wherein the permeability of the core is constant at near zero field over a field strength range of approximately -15 to +15 Oersteds (Oe)."

The alloy chemistry recited in claims 1 and 13 is supported by the specification (page 7, line 25), and the range of the crystallization temperature is supported by FIG. 7 of the present application. Hence, the composition of the alloy is submitted to be clarified.

The annealing below the alloy's crystallization temperature (500°C to 530°C) is submitted to clarify the structure and arrangement concerns of the Examiner. The alloy's crystallization temperature depends on the chemical composition of the alloy. Thus, restricting to the alloy system Fe-B-Si with Fe content in the vicinity of 80 atomic percent clarifies the Examiner's concerns.

Hence, independent claims 1 and 13 have been amended to clarify the structure/composition/arrangement of the magnetic cores of the present application, and are submitted to be definite, to particularly point out and distinctly claim the subject matter which applicants regard as the invention, and to be in form for allowance under 35 U.S.C. §112, second paragraph.

Since claims 7, 8, and 14 depend from amended independent claim 1, claims 7, 8, and 14 are submitted to be definite, to particularly point out and distinctly claim the subject matter which applicants regard as the invention, and to be in form for allowance under 35 U.S.C. §112, second paragraph, for at least the reasons amended independent claim 1 is definite, particularly points out and distinctly claims the subject matter which applicants regard as the invention, and thus, are submitted to be in form for allowance under 35 U.S.C. §112, second paragraph.

#### **REJECTION UNDER 35 U.S.C. §103:**

**A.** In the Office Action, at pages 2-3, claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over applicants' admitted prior art in view of Nakagawa et al. (JP 06-151143) and Becker et al. (USPN 4,262,233). The reasons for the rejection are set forth in the Office Action and therefore not repeated.

Claim 12 has been canceled without prejudice or disclaimer. Hence, the rejection of claim 12 under 35 U.S.C. §103(a) over applicants' admitted prior art in view of Nakagawa et al. (JP 06-151143) and Becker et al. (USPN 4,262,233) is now moot.

**B.** In the Office Action, at pages 3-5, claims 1, 4-5, 7-8, and 11-13, as best understood in view of the rejection under 35 U.S.C. §112, second paragraph, were rejected under 35 U.S.C. §103(a) as being unpatentable over applicants' admitted prior art in view of Nakagawa et al. (JP

06-151143; hereafter, Nakagawa) and Becker et al. (USPN 4,262,233; hereafter, Becker). The reasons for the rejection are set forth in the Office Action and therefore not repeated.

Claims 4, 5, 11 and 12 have been canceled without prejudice or disclaimer. The rejection is traversed with respect to the remaining claims 1, 7-8, and 13, and reconsideration is requested.

Independent claims 1 and 13 have been amended (see above). Paragraph [0035] of the specification supports the amendments to independent claims 1 and 13 of the present application.

Independent claim 8 has been amended to depend from amended independent claim 1. Dependent claim 7 has been amended to depend from amended independent claim 1.

Claims 4, 5, 11 and 12 have been canceled without prejudice or disclaimer.

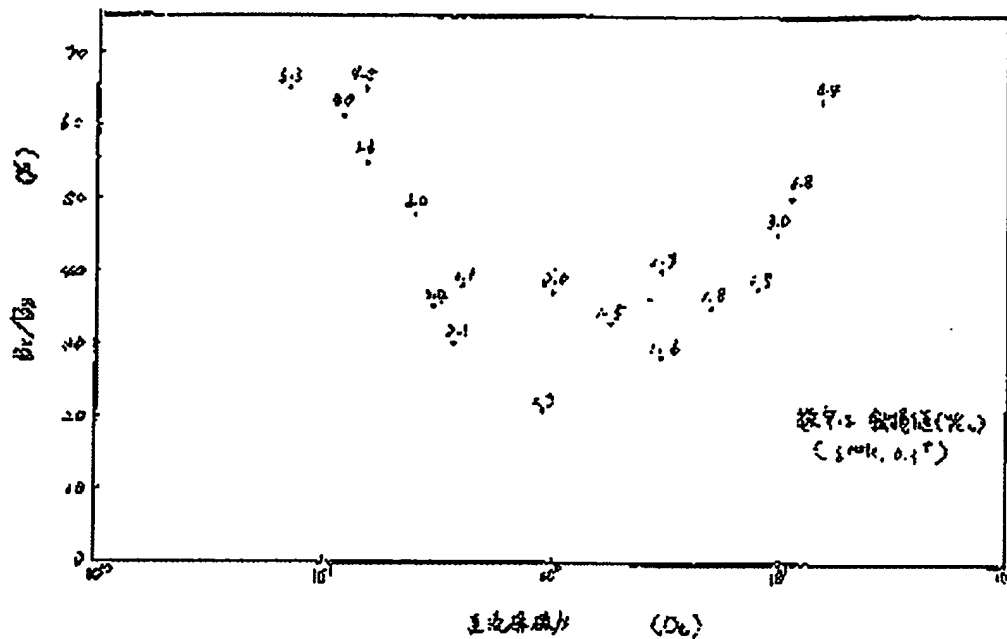
It is respectfully submitted that the Examiner's position that the applicants' admitted prior art (AAPA) discloses a bandpass filter having an inductor including a magnetic core having a linear BH loop having a squareness ratio that approaches zero over a field strength range of approximately -10 Oe to +10 Oe is insufficient to teach or suggest the bandpass filter of amended independent claims 1 and 13 of the present application.

That is, as recited in paragraph [0035] of the specification of the present application, recited below for the convenience of the Examiner, the bandpass filter of the present invention has an inductor including a magnetic core having a linear BH loop having a squareness ratio that approaches zero over a field strength range of approximately -10 Oe to +10 Oe, wherein the permeability is linear up to an induction level of 13 kG, which is not taught or suggested by the AAPA:

[0035] FIG. 3 is a graph depicting magnetization curves for an Fe-based amorphous alloy core according to the invention and a prior art core based on a Co-rich amorphous alloy. The graph indicates that the permeability defined by  $\mu=B/H$  of the core of the present invention is substantially linear. The magnetic field strength H is varied over a range from about -40 Oe to +40 Oe causing a linear change in the corresponding magnetic flux density B over a range of about +13 to -13 kG. The linear permeability property makes the Fe-based core suitable as a bandpass filter circuit in a DSL communication system. The permeability of the prior art core on the other hand is linear only up to the induction level of about 7 kG, which is substantially lower than the 13 kG level reached in the Fe-based core of the present invention. The larger available induction level of the core according to the present invention is desirable because the core can be operational with larger current levels in telecommunication lines. (emphasis added)

As noted in the previous response, FIG. 1 (set forth below for the convenience of the Examiner) and Table 2 of Nakagawa, show that Nakagawa exhibits a minimum of approximately 18% squareness ratio ( $B_r/B_s$ ) (see also Table 2):

【図 1】



Hence, Nakagawa does not teach or suggest a bandpass filter that has an inductor including a non-gapped core having a linear BH loop having a squareness ratio that approaches zero over a field strength range of approximately -10 Oe to +10 Oe, wherein the permeability is linear up to an induction level of 13 kG, as is recited in amended independent claims 1 and 13 of the present application (shown, e.g., in FIG. 3 of the present application).

It is respectfully submitted that, at the time of the Becker invention (USPN 4,262,233), amorphous alloy ribbons with high crystallization temperatures suitable for bandpass filters, such as those in the present application, were not known to those skilled in the art, as is pointed out in col. 4, lines 8-40 of Becker, recited below for the convenience of the Examiner:

#### EXAMPLES OF THE MAGNETIC ANNEALING OF AMORPHOUS ALLOYS

Ten centimeter straight ribbons of METGLAS 2826 amorphous alloy, produced by the Allied Chemical Co. of Morristown, N.J. and having a nominal composition of Ni.sub.40 Fe.sub.40 P.sub.14 B.sub.6 were sealed in tubes under vacuum. A field of 21 Oe along the long axis of the ribbon was obtained from a long solenoid in a shielded area of an oven. A residual field of 4000 Oe from a permanent magnet was used for annealing across the width of the ribbon. Temperatures were monitored by a thermocouple placed next to the sample. (emphasis added)

Toroidal samples were made by winding approximately fourteen turns of MgO-insulated ribbon in a 1.5 centimeter diameter aluminum cup. Fifty turns of high temperature insulated wire were wound on the toroid to provide a circumferential field of 4.5 Oe for processing. The toroids were sealed in glass tubes under nitrogen. A 120 minute heat treatment was used; both dc and ac properties were determined. The ac permeabilities and losses were obtained using sine wave current driven by conventional techniques at frequencies from 100 Hz to 50 kHz.

#### EXAMPLE OF THE MAGNETIC ANNEAL OF A STRAIGHT RIBBON

A straight ribbon of METGLAS 2826 alloy was annealed at 290°C. in the presence of a 21 Oe magnetic field. After annealing, the coercive force of the sample was less than 0.003 Oe. This is believed to be the lowest reported coercive force in any potentially useful soft magnetic material. Samples annealed at temperatures in excess of 360° C exhibited crystalline structures. (emphasis added)

Hence, Becker teaches that amorphous alloy ribbons crystallize at temperatures in excess of 360° C. In contrast, as recited in amended independent claims 1 and 13 of the present application, the amorphous alloy ribbon has a crystallization temperature ranging from 500°C to 530°C, which is considerably higher than the 360°C baseline crystallization temperature of Becker. Hence, it is respectfully submitted that Becker teaches away from amended independent claims 1 and 13 of the present application.

Thus, amended independent claims 1 and 13 of the present application are submitted to be patentable under 35 U.S.C. §103(a) over applicants' admitted prior art in view of Nakagawa et al. (JP 06-151143) and Becker et al. (USPN 4,262,233), alone or in combination. Since claims 7, 8, and 14 depend from amended independent claim 1, claims 7, 8 and 14 are submitted to be patentable under 35 U.S.C. §103(a) over applicants' admitted prior art in view of Nakagawa et al. (JP 06-151143) and Becker et al. (USPN 4,262,233), alone or in combination, for at least the reasons amended independent claim 1 is patentable under 35 U.S.C. §103(a) over applicants' admitted prior art in view of Nakagawa et al. (JP 06-151143) and Becker et al. (USPN 4,262,233), alone or in combination.

#### DOUBLE PATENTING:

In the Office Action, at pages 5-6, claims 1, 4, 7-8, and 11-13 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S.P.N. 6,930,581 B2.

Claims 4, 5, 11, and 12 have been canceled without prejudice or disclaimer.

A terminal disclaimer is being submitted herewith to overcome the rejection based on a non-statutory double patenting ground since the patent is commonly owned with the present application by Metglas, Inc. (see details in Terminal Disclaimer enclosed herein).

Hence, claims 1, 7, 8, 13 and 14 (as well as new claim 15, which represents the features of claim 14 plus the features of amended independent claim 1) are now submitted to be allowable.

**NEW CLAIM:**

New claim 15 recites that the features of the present invention include a bandpass filter, comprising an inductor having a non-gapped core that consists essentially of an Fe-B-Si amorphous alloy ribbon with Fe content in a vicinity of 80 atomic percent and having a crystallization temperature ranging from 500°C to 530°C and heat-treated below the alloy's crystallization temperature, a linear BH loop and a constant permeability ranging from 400 to 1000 over a frequency range of about 1 to 1000 kHz, wherein the permeability is linear up to an induction level of 13 kG. Nothing in the prior art teaches or suggests such. It is submitted that this new claim distinguishes over the prior art.

**ALLOWABLE SUBJECT MATTER:**

In the Office Action, at page 6, the Examiner submitted that claim 14 would be allowable if rewritten to overcome the rejection(s) of 35 U.S.C. 112, second paragraph in the present Office Action, and to include all of the limitations of the base claim and any intervening claims.

New claim 15 is claim 14 together with the features of amended independent claim 1. Hence, new claim 15 is submitted to be allowable in view of the Examiner's comments above.

**CONCLUSION:**

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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